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FURTHER INSTANCES OF MALAR DIVISION.

ALEŠ HRDLIČKA.

By the courtesy of Dr. Horace Jayne, Director of the Wistar Institute, Philadelphia, I am able to report on two skulls, one Peruvian (Indian) and the other that of a Chinese, in both of which is found what appears to be a bilateral, complete, malar division. The specimens and anomalies are as follows:

(1) Spec. No. 53, Wistar Institute, cranium of a male, adult (past middle age), Peruvian Indian. The occiput shows a moderate, predominantly unilateral, baby-board compression. A smaller Wormian bone is present in the left coronal suture and an unusual bone of the same nature, 10 mm. long and 9 mm. in maximum breadth, in the sagittal suture, 28 mm. posterior to bregma. The skull shows no pathological lesion, no signs of traumatism, and no marked anomalies besides those to be described.

Each of the malars is completely divided by an antero-posterior suture into a smaller lower and larger upper portion. The condition is very much alike on the two sides and offers a number of points of special interest. (Fig. 1.)

The body of each malar is very narrow (antero-posterior diameter, dorsally, at middle, 13.5 mm. on the right and 12.5 mm. on the left). This narrowness is caused by an unusual development and extension backward of the malar process of the superior maxillary. The central part of the malar bone was apparently belated in development and a compensation for the defect by the maxillary took place.

The upper, larger portion of each malar shows in its zygomatic border a well marked, 5 mm. long, slightly dentated suture corresponding to the occasional posterior incomplete suture of the normal malar. This suture is supposed to be the remnant of the embryonal separation between the parts of the malar that develop from respectively the superior and inferior center

of ossification of the bone. If this theory is correct, which thus

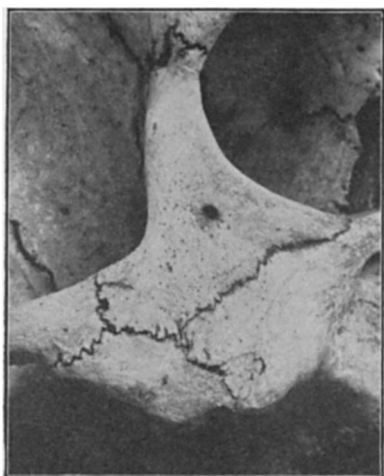


FIG. 1.—Right Malar of a Peruvian Indian, showing an Antero-Posterior Complete Division and above that a Posterior Incomplete Suture.

far there is no reason to doubt, then we have here a clear case of an appearance of a separate, submalar center of ossification. The case would then be not a divided malar, but an imperfectly developed malar, with a *sub-malar*.

Ventrally the anomalous suture is in every respect very much like dorsally. From each of the incomplete sutures in the zygomatic border of the malar proper runs a shallow groove, such as was de-

scribed by Gruber, forward, reaching on the left the malo-maxillary suture.

The upper portion of the right malar shows one, that of the left two nutritive foramina.

This is the second instance of a malar suture observed in an American Indian¹ and in both cases the subject was a Peruvian.

Measurements of the Malars.

	Right.	Left.
Height anteriorly (bet. the ends, dorsally, of the malo-maxillary suture)	33.5	32. mm.
“ at middle	34.5	?
“ posteriorly (dorsally: bet. lowest point of malo-zygomatic and most posterior point of malo-frontal suture)	44.	44. “

¹The first instance was reported by me in the *Amer. Nat.*, April, 1902 (“New Instances of Complete Division of the Malar Bone, with Notes on Incomplete Division,” pp. 273-294).

Measurements of the Malars (continued).

	Right.	Left.
Breadth antero-superiorly (dorsally: bet. the superior extremity of the malo-maxillary and the anterior end of the malo-frontal suture)	33.	34. mm.
“ at middle	13.5	12.5 “
“ inferiorly (bet. lowest points of the malo-maxillary and malo-zygomatic sutures)	25.	25. “
Vertical height of the inferior malar portion, to the malar suture, anteriorly	13.	?
posteriorly	8.5	? ¹

(2) Spec. No. 7217, Wistar Institute, cranium of a male, adult (below middle age) native of China. Skull dolichocephalic, normal. Upper third molars rudimentary; styloids very rudimentary. A small epipteric on left, on right a large epipteric (41.5 mm. long, 10 mm. high), and several episquamous ossicles more posteriorly.

Both malars consist of a larger superior and a smaller inferior portion, separated by an antero-posterior moderately denudated suture, 21 mm. long on the right, 19 mm. on the left side. (Fig. 2.)



FIG. 2.—Left Malar of a Chinese, showing a Complete Antero-posterior Division.

Ventrally the aspect is entirely different. On the left a tapering process from the maxilla reaches and articulates with the zygoma; on the right a similar process exists, but ends within 3 mm. of the zygoma. Both processes cover the malar suture anteriorly and posteriorly, but in the middle leave it, and

¹ The lower malar portion on the left has been lost.

also an island-like part of the superior portion of the malar, uncovered.

The separate inferior portions of the malars resemble somewhat those in case 1

Measurements of the Malars.

	Right.	Left.
Height anteriorly	36.5 mm.	35.5 mm.
“ at middle	36.5 “	35.5 “
“ posteriorly	51.5 “	49. “
Breadth antero-superiorly	38.5 “	37. “
“ at middle	24.5 “	23.5 “
“ inferiorly	32. “	32.5 “
Vertical height of the inferior malar portion, to the malar suture,		
anteriorly	11.5 “	11. “
posteriorly	9. “	8. “

To the above two cases I am able to add the following recent observations of malar suture in the U. S. National Museum :

(a) Skull of a male, middle aged Chickasaw Indian (No. 227, 483, Dep't. of Anthropol., U. S. N. M.). This specimen, recently returned from the Army Med. Mus., was brought to my attention by Dr. D. S. Lamb. Skull shows a somewhat premature closure of sagittal and coronal sutures.

Each malar is divided, in very much the same manner, by an antero-posterior suture into two portions. The lower of these, nearly of an equal extent throughout, is at middle on the right 10 mm., on the left 9 mm. high; the height of the upper portion at middle is on the right 22 mm., on the left 21 mm.

The anomalous suture is on the right as well as on the left dorsally 15 mm., ventrally on the right 5 mm., on the left 6 mm. long. It is shortened by a wedge-like process of the superior maxilla, identical in appearance and only of a slightly lesser extent, to that in the above described, Wistar Institute Peruvian. The upper portion of each malar shows one moderate size foramen, but no incisure.

There are no further anomalies on the cranium.

Among 380 skulls of apes and monkeys¹ in the Department of Biology of the Museum, in which the malar sutures are clearly traceable, there are three, a Macaque, a *Cercopithecus*, and a *Chrysothrix*, with malar division.

(b) *Macacus pelops*, male, adult, No. 22,062. The right malar shows an oblique, serrated division, running dorsally from a short distance above the lower end of the malo-maxillary suture to the curving superior border of



FIG. 3.—Divided right malar of *Macacus pelops*. Natural size.



FIG. 4.—Divided zygomatic process of *Cercopithecus callitae*. Natural size

the zygoma (Fig. 3). The ventral part of the suture lies in nearly the same position. On the left is found dorsally a 4 mm. long suture, beginning from the malo-maxillary suture in a similar position as that on the right side. The two malars are equally high and long. The skull shows no other anomalies.

(c) *Cercopithecus callitrichus*, male, adolescent, No. 16, 365. The right zygomatic process is posteriorly completed by a triangular portion, separated from the main part by a suture. Superiorly the border of the malar portion of the arch just touches that of the temporal portion, inferiorly the two are separated by a distance of 12 mm. (Fig. 4.) The supernumerary suture is serrated and equally well distinct ventrally. It is very plainly anomalous in character; there is not the slightest trace

¹ 1 Chimpanzee, 1 Gorilla, 2 Orangs, 8 Gibbons, 12 Cynocephali, 3 Symphalangis, 1 *Nasalis larvatus*, 6 *Simias concolor*, 55 *Presbytes*, 24 *Semnopithecus*, 116 *Mascagues*, 22 *Cercopithecus*, 10 *Colobi*, 5 *Cercocobi*, 15 *Mycetes*, 6 *Alonata*, 57 *Ateles*, 1 *Lagothrix*, 40 *Cebi*, 6 *Hapale*, 4 *Midas*, 4 *Nictipithecus*, 1 *Saimiri*, and 7 *Chrysothrix*.

of any traumatism. The dimensions of the two malars are almost identical, even inferiorly. The specimen shows no other anomaly.

(d) *Chrysotrix* (Venezuela), male, adolescent, No. 35,800.

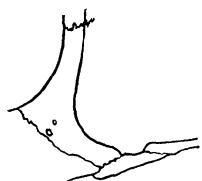


FIG. 5. — Divided zygomatic process of *Chrysotrix* (Vener). Natural size.

On the left side is present an anomalous separation of the zygomatic process from the body of the malar. (Fig. 5.) No trace of any traumatism. On the right the zygomatic arch has been lost. The specimen shows no further anomaly.

No one of the three monkey skulls here mentioned was in any way pathological.

In a number of *Presbytes Semnopithec*i, one *Hylobates*, one *Symphalangus*, five *Macaques*, and one *Ateles*, a more or less pronounced marginal cleft or fissure was seen in the superior border (frontal process), three to five mm. externally to the edge of the orbit, running to a foramen.

There were found in the series no clearly defined anterior or posterior partial malar sutures.

The above six cases present a number of new points and will be of value in the eventual summing up of the whole subject of malar divisions.

Several interesting cases of the anomaly in man and mammals, including an orang, have also recently been reported by Frassetto (*Notes de Craniologie Comparée*, Ann. Sc's. Natur., Paris, Sept. 1903).